

## REMARKS

Claims 33, 16, 21, 22 and 24 - 28 were rejected under 35 U.S.C 103(a) as being obvious over Lebby et al. (U.S. Patent 5,367,593), hereinafter Lebby.

Claim 33 recites that the connector laser diodes (on the bare integrated circuit chip) are formed in a predetermined arrangement from a gallium arsenide substrate and deposited on the bare integrated chip by transfer from an intermediate support that maintains the predetermined arrangement and that the connector defines a base unit link.

Lebby fails to disclose or suggest the features recited in claim 33. Lebby et al. discloses a optical/electrical connector (25) having a base (27), an array of photonic components, each having an optical port (45) and electrical terminals (38). An IC chip (50), which is disclosed as a chip or a board with one or more chips mounted thereon (col. 3, lines 26-28) i.e. a hybrid chip), is positioned in well (30) of base (27) connected to terminals (38) with solder bumps. Electrical terminals of array (45) are disclosed as connected to terminals (38) or directly to IC chip (50).

Nowhere in Lebby is there a disclosure or suggestion of laser diodes formed in a predetermined arrangement from a gallium arsenide substrate and deposited on a bare integrated circuit chip as called for in claim 33. Instead, Lebby merely discloses chip (50) that could be a small printed circuit board or hybrid circuit (see column 3, lines 25 - 30), without any disclosure or suggestion of laser diodes deposited on a bare integrated

circuit chip. A hybrid chip, such as chip 50 in Lebby, includes at least two or more chips with one of the chips dedicated to the photonic components. This is not the same as a bare chip having the control and emission detection circuit and the laser diodes thereon. Nowhere in Lebby is there any disclosure or suggestion of laser diodes on a bare integrated circuit as claimed in claim 33.

Nowhere in Lebby is there a disclosure or suggestion of laser diodes formed in a predetermined arrangement from a gallium arsenide substrate and deposited on a bare integrated circuit chip by transfer from an intermediate support that maintain the predetermined arrangement as in claim 33. Instead, Lebby merely discloses that array (45) may be directly connected to or formed on chip (50) (see column 3, lines 25 - 30 and column 4, lines 40 - 46) with out any disclosure or suggestion of how the array is directly connected to or formed on the chip. Lebby does not disclose expressly or otherwise how the array (45) may be directly connected to the chip (50) (which, in Lebby, can be a PCB or hybrid chip), and no where in Lebby is there a disclosure or suggestion of any process by which the laser diodes formed in a predetermined arrangement from a gallium arsenide substrate are deposited on a bare integrated circuit chip by transfer from an intermediate support that maintain the predetermined arrangement as called for in claim 33. The bare disclosure in Lebby that photonic components can be formed directly on IC chip 50 (a PCB or Hybrid chip) is not enough to make it obvious to one skilled in the art that the diodes are formed in a predetermined arrangement from a GaAs substrate and deposited on the bare IC chip by transfer from an intermediate support in claim 33. Lebby fails to disclose any such process.

It is respectfully submitted, that the Examiner has improperly failed to give any weight to the process steps recited in claim 33. The determination of patentability is based on the product itself. However, the Examiner has failed to recognize that the structure implied by the process must be considered when assessing the patentability of claim 33 over the prior art, because the manufacturing process called for imparts distinctive structural characteristics to the claimed connector (see MPEP 2113). Claim 33 calls for laser diodes formed in a predetermined arrangement from a GaAs substrate and deposited on the IC chip by transfer from an intermediate support that maintains the predetermined arrangement. As described below, this provides a connector that is structurally very different from what is disclosed in Lebby and that has distinctive structural characteristics that are different from what is disclosed in Lebby or any other cited prior art. As described in the specification of the present application, on page 4, lines 18-21, "the direct transfer (i.e. with the intermediate support that maintains the predetermined arrangement of the diodes) makes it possible to overcome the need for a printed circuit or a hybrid circuit which, in the prior art, enables the association of the laser diodes and the various electronic circuits needed to make them work". Indeed, it would appear from col. 3, lines 25-29, that the IC chip 50 in Lebby is a printed circuit board or hybrid circuit (thereby allowing photonic components to be formed on the IC chip, col. 4, lines 42-43). Thus, the Lebby connector has the exact structure overcome by the connector called for in Claim 33. The claimed features enables use of a bare IC chip with laser diodes thereon without having to use a printed circuit board or hybrid circuit structure (as disclosed in Lebby), which results in tight r tolerances on the location of the laser diodes, lack of damage

to other components on the chip from thermal or structural stress that may occur with conventional techniques of forming photonic components on a chip. These features of greatly improved tolerances on laser diode locations, and reduction or elimination of faults in the other components arising from conventional techniques, are structural differences with respect to conventional connectors. Thus, the features called for in claim 33 provide a connector structurally different from that in Lebby or any other cited prior art.

The features of claim 33 are neither disclosed nor suggested nor made obvious by Lebby et al. (U.S. Patent 5,367,593). Accordingly, claim 33 is patentable over Lebby et al. (U.S. Patent 5,367,593).

In addition to the features of claim 33, claim 16 recites that the laser diodes are transferred on the integrated circuit with a space between these diodes equal to a space between optical fiber terminations in the optical port. Lebby fails to disclose or suggest the features recited in claim 16. Specifically, Lebby fails to disclose or suggest that the laser diodes are transferred on the integrated circuit and thus cannot possibly disclose or suggest a transfer with a space between these diodes equal to a space between optical fiber terminations in the optical port. The Examiner has indicated that the spacing between the diodes would inherently be the same as the spacing between the fibers despite the fact that Lebby fails to disclose any such transfer. Hence, the Examiner appears to be using impermissible hindsight and using the applicant's disclosure against him. Though the diodes in Lebby have to be formed or connected somehow, the failure of Lebby to disclose any such transfer of the diodes cannot possibly give rise, inherently or

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otherwise, that diodes are transferred on the IC chip with the space between diodes equal to the space between the fiber terminations. There is no mention in Lebby or any of the cited references of the laser diodes being transferred on the integrated circuit with a space between these diodes equal to a space between optical fiber terminations in the optical port and hence it can not be inherent (i.e. it can not necessarily arise) from a failure to disclose any transfer of any kind that the laser diodes are transferred as claim 16.

For the reasons set forth above relating to claims 16 and 33 the features of claim 16 are neither disclosed nor suggested nor made obvious by Lebby et al. (U.S. Patent 5,367,593). Accordingly, claim 16 is patentable over Lebby et al. (U.S. Patent 5,367,593).


Claims 21, 22 and 24 - 28 all depend from claim 33. Accordingly, claims 21, 22, 24 - 28 and 33 are patentable over Lebby et al. (U.S. Patent 5,367,593) at least for the aforementioned reasons.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

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Respectfully submitted,

  
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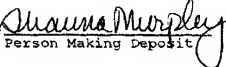
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